



¹ General Surgery, St George's Hospital, Tooting SW17 0QT, UK

² AbScent, Andover, UK

³ Garforth Medical Centre, Leeds, UK

⁴ ENT Department, Guy's and St Thomas' Hospitals, London SE1 9RT, UK

Correspondence to: C Hopkins
clairehopkins@yahoo.com

Cite this as: *BMJ* 2022;377:e069860
<http://dx.doi.org/10.1136/bmj-2021-069860>

Published: 27 April 2022

PRACTICE POINTER

Parosmia—a common consequence of covid-19

Abigail Walker,¹ Chrissi Kelly,² Gill Pottinger,³ Claire Hopkins⁴

What you need to know

- Parosmia is a common sequelae of smell loss associated with covid-19, with onset on average three months after initial infection
- Refer patients with parosmia without a clear preceding cause such as covid-19 and those with red flag symptoms
- The presence of parosmia is positively associated with better outcomes from olfactory training in patients with loss of sense of smell—they are more likely to regain their sense of smell than those without parosmia

The first early reports of olfactory dysfunction associated with covid-19 identified loss of smell as one of the cardinal symptoms of covid-19. Loss of smell may be total (anosmia) or partial (hyposmia) and may be associated with loss of taste (complete ageusia or hypogeusia dependent on degree of loss), and these issues with inability to perceive smell are addressed in our earlier article.¹ With time, it has become apparent that patients were not only unable to detect odours (quantitative olfactory dysfunction) but some went on to experience a distortion of normal smell perception (qualitative olfactory dysfunction; see [box 1](#) for definitions).

Box 1: definitions and types of olfactory dysfunction

- Quantitative olfactory dysfunction*—Impairment in the ability to detect an odour. May be reduced (hyposmia), absent (anosmia), or excessive (hyperosmia)
- Qualitative olfactory dysfunction*—Misperception of an odour. May manifest as perception of a smell when no odour is present (phantosmia) or distortion of an odour (parosmia)
- Dysosmia*—Broad term to denote olfactory dysfunction of any type
- Cacosmia*—Perception of a foul smell. May be appropriate perception of an external stimulus (such as a rhinolith, nasal foreign body) or a manifestation of parosmia (misperception of a non-offensive odour as foul)

Here we offer an approach to the assessment and management of parosmia and phantosmia, based largely on expert and patient experience given the limited evidence base. A typical severe case might be one of a patient with covid-19 reporting initial complete loss of smell and taste lasting for several weeks, followed by apparent recovery. However, a short time later the patient notices that raw chicken smells “off” or is certain that there is a smell of cigarette smoke in the house that others cannot perceive. Within a couple of weeks, an increasing

number of foods and toiletries trigger a similar rancid odour, until the patient cannot bear the smell of food and their diet becomes extremely restricted, leading to weight loss. The patient withdraws socially and struggles with coffee smells in the workplace, becoming increasingly isolated as their family try to be supportive but find it hard to understand. In distress, the patient turns to their GP, desperate to know if this ever going to get better.

What is parosmia and what causes it?

Parosmia, the misperception of an odour, unfortunately most often manifests as the transformation of a pleasant odour into an unpleasant one (see [box 2](#) for some patient descriptions of the symptom).

Box 2: Patient descriptions of parosmia (from the AbScent online forum <https://abscent.org/>)

The “covid smell”

- “I’ve never smelt this before, so I find it hard to describe”
- “Everything smelled and tasted like raw sewage, and trying to eat made me vomit”
- “My word for it is ‘funky.’ It’s not like anything else, but I describe it as a sweet, sickly, sour odour”
- “Rancid, cloying, death”

How parosmia makes me feel

- “I’m really struggling, and it’s so hard when no one around you understands; the thought of it going on this bad for months on end is unimaginable”
- “I was crying every day, and finally called my doctor for some antidepressants”

It is a relatively common phenomenon—one cross-sectional population study conducted in 2007 suggested a prevalence of 3.9% in adults.² The causes of parosmia have substantial crossover with those of smell loss, and include:

- Postviral (covid-19, influenza)
- Head injury
- Neurodegenerative conditions such as Alzheimer’s and Parkinson’s diseases
- Medications, particularly selective serotonin reuptake inhibitors (SSRIs), serotonin and norepinephrine reuptake inhibitors (SNRIs), benzodiazepines, and non-benzodiazepine sedatives (half of the 100 most prescribed medications have the potential to cause olfactory disturbance³)

- Chemical exposure of the nasal mucosa to toxins including ammonia, nickel, solvents, tobacco, and cocaine.

What is the natural course of postviral olfactory dysfunction?

The dominant viral pathogen of late has been covid-19, and parosmia has been encountered as a common sequelae. When the early phase of illness is associated with loss of smell, parosmia is a late onset symptom in the majority of patients who report it, developing on average three months after infection.^{4 5} Many patients who experience anosmia have a short period of apparent recovery with a return in their sense of smell, which is then followed by the development of parosmia; others, however, develop parosmia without any preceding apparent smell loss.

Although high rates of spontaneous recovery have been reported for non-covid related parosmia, the timeline varies widely from months to sometimes years.⁶ A survey of 434 patients with self reported olfactory loss after covid-19 found that 43.1% reported parosmia at six months.⁷ The outlook beyond that time is still unclear, with longitudinal studies still ongoing. Anecdotal reports, based on clinical experience and reports in a patient support group for those with parosmia, suggest recovery typically occurs roughly 14-16 months after infection in patients with covid-19, although those with shorter duration may not seek out help or support.

What is the pathophysiology of parosmia?

Patients often tell us that they find the analogy of crossed wires a useful way of understanding the pathophysiology of parosmia. Parosmia may represent aberrant neuronal regeneration that occurs during recovery of the olfactory system from the viral insult, and that its presence is associated with higher rates of spontaneous olfactory recovery than those with anosmia alone.⁸

How can I be sure that covid-19 has caused a patient’s parosmia?

As with much of medicine, the attribution of a cause to parosmia is largely based on the balance of probabilities. A young patient

who is otherwise fit and well and who had had confirmed covid-19 two to three months before parosmia is, on balance, most likely to have a covid-19 related olfactory dysfunction. If patients have a confirmed preceding diagnosis of covid-19, there is no need for routine investigations by blood tests or imaging. Some patients will not link parosmia with previous infection because of the delayed onset, or may not have been aware of an otherwise largely asymptomatic infection—initial olfactory loss may be overlooked.

Many patients will not have an unambiguous relationship between development of parosmia and covid-19. Assessment should begin as per loss of sense of smell (see our prior article on anosmia for further guidance¹). Any symptoms of nasal obstruction and discharge, if present at the onset of covid-19, have usually subsided by the onset of parosmia, but if they are persistent then anterior rhinoscopy should be performed to look for signs of chronic rhinosinusitis and other sinonasal conditions.

Phantosmia is the perception of smell when no odour is present. This can be a difficult symptom to identify and distinguish from parosmia. In general, patients with parosmia are able to reproduce their symptoms (for example, a cup of coffee always smells terrible), whereas phantosmia occurs in the absence of an external stimulus. Space-occupying lesions of the central nervous system are an uncommon but important cause of phantosmia,⁹ and all patients with olfactory hallucinations in the absence of a clear underlying cause (such as covid-19) should be investigated for this. Other causes are migraines, temporal lobe epilepsy, and the same as those for parosmia.

Red flags are listed in [table 1](#). In the absence of these, patients can be reassured that sinister causes are extremely rare. Consider further investigations such as magnetic resonance imaging (MRI) in the presence of additional neurological signs and symptoms or in the absence of known covid-19 infection. Parosmia is uncommon in the acute phase of covid-19¹⁰; testing for covid at onset of parosmia is unlikely to be helpful and the patient unlikely to be infectious.

Table 1 | Red flag symptoms of olfactory disturbance

Symptoms	Relevance to patient
Dysosmia with focal seizures	May represent temporal lobe epilepsy and should be referred to neurology
Dysosmia with signs of raised intracranial pressure (morning vomiting, headache on straining, focal neurology)	May represent a space-occupying lesion of the central nervous system and should be investigated with appropriate imaging
Foul smell detectable within the nose or to others (cacosmia) in an adult	May represent underlying dental disease and should be directed concurrently for dental and ENT review
Cacosmia and discharge in a child	May represent a nasal foreign body and should be directed for ENT review urgently
New neck lump with any nasal symptom (change in sense of smell, blockage, bleeding, discharge)	Patient should be informed that sinonasal malignancy is an uncommon but important differential

What practical advice can be offered?

There are currently no effective, evidence based treatments for patients with parosmia. We find that patients often find useful tips from others who have experienced similar symptoms. Some of these, as shared in online forums hosted by the charities AbScent and Fifth Sense, are listed in [box 3](#).

Box 3: Practical tips on living with parosmia, developed by clinical advisors and contributors (from AbScent <https://abscent.org/>)

- Get to know your trigger foods and “safe” foods. These will be changing all the time, so continue to try new things. A list pinned to

the fridge will remind you and family members what is OK and what needs to be avoided.

- Room temperature or cold food will give off less odour and will be easier to eat. While roasted chicken can be impossible to manage for many, a cold chicken sandwich without skin can be tolerable.
- Talk to those you are living with so that they can support you. Using a “team approach” for buying food, food preparation, menu planning, etc, may be necessary.
- Parosmia can fluctuate. Some days will be worse than others. Try not to feel that a bad day is a setback that will be permanent. Over time, these fluctuations will even out.

- For severe cases of parosmia where no food seems tolerable, referral to a dietician is advisable.
- Keeping a diary and continuing to try things periodically—such as a favourite food that you feel you can't tolerate today—will help you identify signs of what may be a very slow and subtle recovery. You don't need to make notes every day, but a weekly recording can be helpful.
- Some people find that “pushing through” the unpleasant taste in food is a way to make things improve. This may not be possible in the early stages of parosmia if nausea is a problem, but as time goes on it can be helpful.
- Parosmia can affect your personal relationships—try to be as open about this as possible. Keeping your feelings from your partner can make the isolation feel worse.
- We are hearing recovery stories even after 21 months. There is no hard and fast timeline for recovery.

Olfactory training is a technique that has been developed for patients with smell loss. At present we lack evidence of its efficacy in treating parosmia itself, but it may be applied in the hope that providing controlled odour cues may promote orderly neuronal regeneration. A study of 153 patients with postviral smell loss who completed olfactory training found that those with parosmia had better outcomes in terms of odour identification and discrimination compared with those who did not have parosmia.¹¹ Visual guides for patients are freely available online (for example, <https://abs-cent.org/nosewell/smelltraining>).

Intranasal treatments such as topical corticosteroids have been trialled in olfactory loss and subsequently applied to parosmia, although there is little evidence to support this. A small trial of intranasal sodium citrate reported improvements in phantosmia but not parosmia or hyposmia,¹² and the results may simply reflect the natural course of the symptoms rather than the effectiveness of treatment. Evidence for other treatments is lacking, although trials are ongoing. Sodium valproate, gabapentin, and pregabalin have been used to treat parosmia as an off-label use despite an absence of evidence.¹³ Because of the risks of adverse effects, these should be trialled only in severe cases.

What are the psychological impacts of parosmia?

Parosmia can be very distressing, and it is important to acknowledge this as many patients report that they feel that their symptoms have been trivialised by healthcare providers. Parosmia may turn previous sources of joy such as food, gardening, or physical intimacy into causes of distress.¹⁴ Olfactory dysfunction is associated with depression and anxiety¹⁵; loss of appetite caused by either repulsion by food or these associated mood disorders may lead to considerable weight loss and malnourishment. Holistic support should include active screening for these comorbid conditions.

Patients with parosmia can find excellent online resources from charities such as AbScent (<https://abscent.org/>) and Fifth Sense (www.fifthsense.org.uk), which have well resourced and accurate information on management strategies such as olfactory training. Some of the topics discussed in these fora are listed in [box 4](#).

Box 4: Frequently asked questions in the Abscent Parosmia Support Group (<http://facebook.com/groups/AbScentParosmia>)

- *Why does my wee smell weird?*
 - Many people report that their own body odours are a common trigger for parosmia—including bodily fluids, breath, and sweat. Be reassured that others cannot detect the distorted smell.

- *I had completely recovered before parosmia started—How does this happen?*
- *I had covid-19 but didn't lose my sense of smell—Can I still get parosmia?*
 - Sensitive smell tests show us that, while the early phase of recovery feels as if everything has returned to normal, there is often still hyposmia, or a reduced sense of smell, reflecting loss of some of the olfactory sensory nerves. When these start to recover, parosmia can emerge.
 - Similarly, some people don't notice any smell loss at the time of covid-19 infection, although they do have some loss of olfactory function on sensitive smell tests performed early on, and may still go on to develop parosmia. In some cases, people may not even have been aware that they had been infected as they may not have had any other symptoms at the time.
- *Do I need to see a doctor?*
 - If you have a confirmed diagnosis of covid-19, then further investigations are not normally required to investigate the cause of parosmia. An ENT specialist will likely only be able to provide you with reassurance and general advice, but at the moment there are no proven medical treatments that speed up recovery.
 - Parosmia may have a significant impact on wellbeing and mental health: if you are struggling, please speak to your GP.
- *Even water tastes weird*
 - Parosmia can be triggered by a wide range of odorants, which can be extremely distressing. In some very severe cases medication may be used to suppress the parosmia, but general dietary modifications and use of nose clips can help maintain oral intake.
- *Why haven't doctors found a cure yet?*
 - Research into olfactory disorders has been a neglected area prior to covid-19. The pandemic has increased funding, and there are many studies under way to look for treatments for olfactory loss and parosmia. Because of the relatively high spontaneous recovery rate, these studies have to include a control group of patients and study large numbers of patients, and will therefore take some time to complete.
- *Will this ever go away?*
 - We expect that parosmia will reduce and underlying sense of smell improve in many patients. Recovery can continue for months and years—it is too early at this stage in the pandemic to consider it permanent.
- *I think the vaccine caused my parosmia—Is this possible?*
 - There is some evidence that vaccination may help in recovery of olfactory dysfunction after covid-19. As parosmia is thought to reflect a stage in recovery and positive predictor in long term outcome, this may therefore appear after vaccination.

Education into practice

- What additional symptoms or signs would prompt an urgent referral in a patient presenting with parosmia?
- How would you support a patient with parosmia that is affecting their mood, diet, and day-to-day life?

How patients were involved in this article

Posts made in the AbScent Parosmia Facebook group were used to identify frequently asked questions, and patient comments were made in response to questions posed by the moderators for the purpose of writing this paper. CK has experienced parosmia and provided a patient perspective in the writing of the manuscript

Competing interests: We have read and understood *BMJ* policy on declaration of interests and declare the following interests: CK is the founder of AbScent, a non-profit patient support group for people with olfactory dysfunction.

Patient consent: Not required (patient anonymised, dead, or hypothetical).

Provenance and peer review: Commissioned; externally peer reviewed.

- 1 Walker A, Pottinger G, Scott A, Hopkins C. Anosmia and loss of smell in the era of covid-19. *BMJ* 2020;370:m2808. doi: 10.1136/bmj.m2808 pmid: 32694187
- 2 Nordin S, Brämerson A, Millqvist E, Bende M. Prevalence of parosmia: the Skövde population-based studies. *Rhinology* 2007;45:50-3.pmid: 17432070
- 3 Schiffman SS. Influence of medications on taste and smell. *World J Otorhinolaryngol Head Neck Surg* 2018;4:84-91. doi: 10.1016/j.wjorl.2018.02.005 pmid: 30035266
- 4 Cook E, Kelly CE, Burges Watson DL, Hopkins C. Parosmia is prevalent and persistent amongst those with COVID-19 olfactory dysfunction. *Rhinology* 2021;59:222-4.pmid: 33377890
- 5 Lerner DK, Garvey KL, Arrighi-Allisan AE, et al. Clinical features of parosmia associated with COVID-19 infection. *Laryngoscope* 2022;132:633-9. doi: 10.1002/lary.29982 pmid: 34870334
- 6 Bonfils P, Avan P, Faulcon P, Malinvaud D. Distorted odorant perception: analysis of a series of 56 patients with parosmia. *Arch Otolaryngol Head Neck Surg* 2005;131:107-12. doi: 10.1001/archotol.131.2.107 pmid: 15723940
- 7 Hopkins C, Surda P, Vaira LA, et al. Six month follow-up of self-reported loss of smell during the COVID-19 pandemic. *Rhinology* 2021;59:26-31.pmid: 33320115
- 8 Hummel T, Lötsch J. Prognostic factors of olfactory dysfunction. *Arch Otolaryngol Head Neck Surg* 2010;136:347-51. doi: 10.1001/archoto.2010.27 pmid: 20403850
- 9 Landis BN, Reden J, Haehner A. Idiopathic phantosmia: outcome and clinical significance. *ORL J Otorhinolaryngol Relat Spec* 2010;72:252-5. doi: 10.1159/000317024 pmid: 20714205
- 10 Parma V, Ohla K, Veldhuizen MG, et al. GCCR Group Author. More than smell—COVID-19 is associated with severe impairment of smell, taste, and chemesthesis. *Chem Senses* 2020;45:609-22. doi: 10.1093/chemse/bjaa041 pmid: 32564071
- 11 Liu DT, Sabha M, Damm M, et al. Parosmia is associated with relevant olfactory recovery after olfactory training. *Laryngoscope* 2021;131:618-23. doi: 10.1002/lary.29277 pmid: 33210732
- 12 Whitcroft KL, Gunder N, Cuevas M, et al. Intranasal sodium citrate in quantitative and qualitative olfactory dysfunction: results from a prospective, controlled trial of prolonged use in 60 patients. *Eur Arch Otorhinolaryngol* 2021;278:2891-7. doi: 10.1007/s00405-020-06567-7 pmid: 33471169
- 13 Hawkes CH, Doty RL. *Smell and taste disorders*. Cambridge University Press, 2018;doi: 10.1017/9781139192446.
- 14 Burges Watson DL, Campbell M, Hopkins C, Smith B, Kelly C, Deary V. Altered smell and taste: Anosmia, parosmia and the impact of long Covid-19. *PLoS One* 2021;16:e0256998. doi: 10.1371/journal.pone.0256998 pmid: 34559820
- 15 Chen B, Benzien C, Faria V, et al. Symptoms of depression in patients with chemosensory disorders. *ORL J Otorhinolaryngol Relat Spec* 2021;83:135-43. doi: 10.1159/000513751 pmid: 33756467